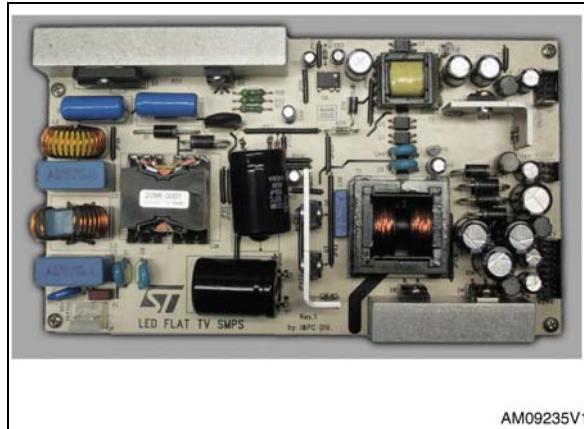


185 W power supply with PFC and standby supply for LED TV based on the L6564, L6599A and Viper27L

Data brief

Features

- Universal input mains range: 90÷264 Vac - frequency 45÷65 Hz
- Output voltage 1: 130 V ±8 % at 620 mA for backlight
- Output voltage 2: 24 V ±8 % at 2 A for audio supply
- Output voltage 3: 12 V ±1 % at 4 A for panel supply
- Output voltage 4: 5 V ±2 % at 2 A for microprocessor supply
- Mains harmonics: acc. to EN61000-3-2 Class-D or JEITA-MITI Class-D
- Standby mains consumption: <170 mW at 230 Vac with 50 mW load
- Overall efficiency at full load: >90%
- EMI: according to EN55022-Class-B
- Safety: according to EN60065
- Dimensions: 115x204 mm, 25 mm maximum component height from PCB
- PCB: single side, 70 µm, CEM-1, mixed PTH/SMT introduction
- RoHS compliant



AM09235V1

the logic circuitry, and a bigger section composed of a front-end PFC, using the new TM L6564 and an LLC resonant converter, using the L6599A, delivering three output voltages: 12 V dedicated to supplying the TV panel, 24 V to supplying the audio power amplifiers, and 130 V dedicated to the backlight.

The PFC stage delivers 400 V constant voltage and acts as the pre-regulator for both the LLC stage and the standby supply.

An external signal, referred to secondary ground, turns the PFC and the LLC stage on and off.

Description

The EVL185W-LEDTV is a high-end demonstration board tailored to the specifications of a typical LED TV application. The peculiarities of this design are the very high average efficiency of about 90%, without synchronous rectification, and very low no load consumption of 100 mW at 230 Vac. The result is that this converter is compliant to the most demanding ENERGY STAR® eligibility criteria. The architecture is made up of two sections, based on a three-stage approach: a 10 W standby supply using the new VIPer27L, which delivers the 5 V standby dedicated to supplying the microprocessor and

1 Efficiency

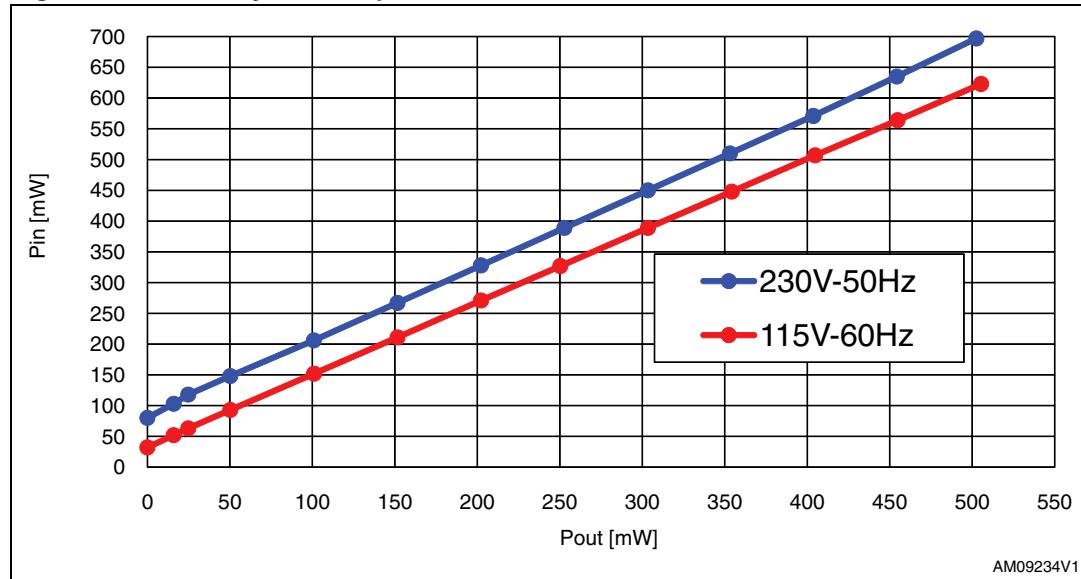
Thanks to the chipset used, the main peculiarities of this design are the very high efficiency as well as the very low input consumption during standby operation.

Table 1. Overall efficiency measured at 230 Vac mains voltage

| Test | 230 V - 50 Hz | | | | | | | | | | |
|----------------|---------------|----------|----------|----------|----------|----------|----------|----------|----------|---------|----------|
| | 12 V | | 24 V | | 130 V | | 5 V | | Pout [W] | Pin [W] | Eff. [%] |
| | Vout [V] | Iout [A] | Vout [V] | Iout [A] | Vout [V] | Iout [A] | Vout [V] | Iout [A] | | | |
| 25% load eff. | 11.95 | 1.00 | 24.19 | 0.50 | 128.89 | 0.15 | 5.05 | 0.50 | 46.09 | 52.00 | 88.6 |
| 50% load eff. | 11.93 | 2.01 | 24.28 | 1.00 | 129.95 | 0.31 | 5.04 | 1.00 | 93.30 | 101.50 | 91.9 |
| 75% load eff. | 11.90 | 3.01 | 24.38 | 1.50 | 131.05 | 0.47 | 5.04 | 1.50 | 141.67 | 151.90 | 93.3 |
| 100% load eff. | 11.88 | 3.99 | 24.48 | 2.00 | 132.18 | 0.62 | 5.04 | 2.00 | 187.96 | 201.50 | 93.3 |
| Average eff. | | | | | | | | | | | 91.8 |

Table 2. Overall efficiency measured at 115 Vac mains voltage

| Test | 115 V - 60 Hz | | | | | | | | | | |
|----------------|---------------|----------|----------|----------|----------|----------|----------|----------|----------|---------|----------|
| | 12 V | | 24 V | | 130 V | | 5 V | | Pout [W] | Pin [W] | Eff. [%] |
| | Vout [V] | Iout [A] | Vout [V] | Iout [A] | Vout [V] | Iout [A] | Vout [V] | Iout [A] | | | |
| 25% load eff. | 11.95 | 1.00 | 24.19 | 0.50 | 128.89 | 0.15 | 5.05 | 0.50 | 46.09 | 52.35 | 88.0 |
| 50% load eff. | 11.93 | 2.01 | 24.28 | 1.00 | 129.95 | 0.31 | 5.04 | 1.00 | 93.30 | 102.85 | 90.7 |
| 75% load eff. | 11.90 | 3.01 | 24.38 | 1.50 | 131.05 | 0.47 | 5.04 | 1.50 | 141.67 | 154.92 | 91.4 |
| 100% load eff. | 11.87 | 3.99 | 24.47 | 2.00 | 132.15 | 0.62 | 5.04 | 2.00 | 187.76 | 206.84 | 90.8 |
| Average eff. | | | | | | | | | | | 90.2 |

Figure 1. Standby consumption

2 Revision history

Table 3. Document revision history

| Date | Revision | Changes |
|-------------|----------|------------------|
| 04-Apr-2011 | 1 | Initial release. |

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